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Knowledge of Pregnant Women about Fetal Congenital Anomalies

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Abstract:Background:Background: Proper knowledge about risk factors and prevention of congenital malformations in pregnant women can lead to primary prevention of disease.**Aim of the study** was to assess knowledge of pregnant women about fetal congenital anomalies.**Subjects and Method:Research design:** A descriptive design. **Setting:** The study was conducted at maternity outpatient clinics at Zagazig university hospitals in Sharkia Governorate, Egypt. **Subjects:** Purposive sample of 574 pregnant women who attended the selected setting. **Tools of data collection:** Two tools were used for data collection. Tool 1: interviewing questionnaireand Tool 2: knowledge questionnaire about fetal congenital anomalies. **Results:** Theoverall knowledge of pregnant women about fetal congenital anomalies showed that there were highly statistically significant differences between total knowledge of the studied women and their gravidity, parity and history of stillbirth at ($p < 0.001$). While, there was no statistically significant differences with women'scurrent gestational age, history of abortion, antenatal follow up, history of delivery of child with congenital anomalies, family history of congenital anomalies and complications of current pregnancy at ($p > 0.05$). **Conclusion:** More than two thirds (69.2%) of the studied sample had unsatisfactory level of total knowledge about fetal congenital anomalies. While, (30.8%) of them had satisfactory level of total knowledge about fetal congenital anomalies. **Recommendation:** There is a need for public programs to increase knowledge about congenital anomalies in pregnant women and people

Keywords:*Knowledge, Pregnant women, Congenital anomalies*

Introduction

Knowledge of people about congenital anomalies (CAs) and their causes differ from society to society. CAs refers to conditions of prenatal origin that are present at birth. Congenital anomalies may result in long-term disability, which may have significant impacts on individuals, families, health-care systems. CAs varies

between different countries ranging from 2.0% to 10.0% of births. The causes of around 40.0–50.0% of birth defects are unknown. A combination of hereditary, environmental factors, genetics and maternal illnesses are attributed to congenital anomalies (***Masoumeh et al., 2015***).

CAs encompass a wide array of structural and functional abnormalities that can occur in isolation (i.e., single defect) or as a group of defects (i.e., multiple defects). Multiple defects may occur as part of well-described associations, such as the non-random co-occurrence of Vertebral anomalies, Anal atresia, Cardiac defects, Tracheoesophageal fistula, and/or Esophageal atresia, Renal and Radial anomalies, and Limb defects (***DeSilva et al., 2016).***

Approximately 3.0% of pregnancies will show a fetal structural anomaly in a sonogram, which can range from a single minor defect to severe multisystem anomalies that are fatal. Genetic investigations are important in the evaluation and clinical triage of fetal structural anomalies. For more than 30 years, conventional prenatal cytogenetic analysis was the first-line method to investigate these anomalies but, within the last 10 years, chromosomal microarray analysis has been increasingly adopted to detect submicroscopic pathogenic copy number variations (CNVs) in prenatal diagnoses. The addition of chromosomal microarray testing to karyotyping increases the frequency of detection of chromosomal abnormalities by 3.0–5.0% (***Lord et al., 2019***).

Teaching the society about CAs is a very important issue because it is a powerful tool to prevent societal discrimination and reviles. Understanding societal and parent's knowledge, attitudes, perceptions/beliefs, and practices on CAs and their risk factors are important to uncover and address the problem to implement strategic plans for community teaching to eliminate or reduce the existing problems (***Taye, 2021***).

Significance of the study:

Prenatal structural or functional abnormalities, known as fetal congenital malformations, are a serious public health concern and the leading cause of newborn mortality. These alterations can be detected throughout pregnancy, labor, and delivery, or even years after birth. Planning effective preventative measures might benefit from pregnant women's knowledge of congenital abnormalities. Therefore, this study would be carried out to assess knowledge of pregnant women about fetal congenital anomalies.

Aim of the study wasto assess knowledge of pregnant women about fetal congenital anomalies.

Question of the study*:*

What is the knowledge levelof the pregnant women about fetal congenital anomalies?

Subjects and Methods:

Research design: A descriptive research design was used to conduct this study.

Study setting: The current study was carried out at maternity outpatient clinics at Zagazig university hospitals in Sharkia Governorate, Egypt.

Study Subjects and Sample type: Purposive sample of pregnant women (574) in second and third trimester.

The estimated sample size is **574** women at confidence level 99.0% ***(Thompson, 2012).***

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

4300*(0.50*0.50) = **1.075**

n= ——————————————————————— **574**

4299*(0.0025/ 6.6358) = 4299*0.000377= 1.6207 + 0.25=**1.8707**

Which:

n= Sample size.

N= Total Population.

Z= The standard value corresponding to confidence level 99% which is (2.576).

d= Margin of Error 0.05.

p= Population Proportion= 0.50.

Tools of data collection:

Appendix I: Interviewing questionnaire: It includes four parts ; demographic data, obstetric history, family history and medical history.

Appendix II: Knowledge questionnaire about fetal congenital anomalies: It included questions related to fetal congenital anomalies as background about fetal congenital anomalies, source of background, definition …etc.

System of scoring for Appendix II:

There were twelve questions on the questionnaire, and a total of twenty-four grades were awarded. A full right response received two points, an incomplete response received one point, and a bad answer or don't know received zero points. A total score was generated by adding these scores together. It was divided into two groups:

- Satisfactory knowledge if the score was greater than 70.0%.
- Un satisfactory knowledge if the score is less than 70.0%.

Content Validity and Reliability:

The revision of modified tools done by 3 experts in Maternity -Gynecological Health Nursing specialty to measure validity and reliability of tools. Cronbach's alpha was used to assess the study tools' reliability. Its value was 0.878 for appendix II (knowledge questionnaire about fetal congenital anomalies).

Field work:

The data gathering period was from July 1st, 2023, to December 31st, 2023. The study appendix was tested and assessed following official approval. During the interviews, the researcher gave the expectant mothers a rundown of the study's objectives and asked their verbal permission. The investigator began gathering data in two stages:

1. **The interview stage:** The researchers came to this setting during the morning shift on Sunday, Monday, and Wednesday, the three hottest days of the week, from 9:30 am to 12 pm. The researcher conducted individual interviewers in the waiting areas of outpatient clinics with each pregnant woman who met the sample requirements. Between three and five pregnant women were questioned on average each day. In order to conduct the research, two appendices were employed. The first appendix had an interviewing questionnaire that was used to gather information on the demographics, obstetric history, and family history of pregnant women as well as to evaluate their medical conditions within a 10-minute time frame. All data of fetal congenital abnormalities is provided in the second appendix (knowledge questionnaire). The researchers evaluated it by filling out the form in ten minutes or less. Each interview lasted for a total of twenty minutes.
2. **Stage of assessment:** The researchers began gathering data from expectant mothers regarding definitions, types, risk factors, prevention, diagnosis, and problems at this stage.

Pilot study:

A pilot study including about 57 pregnant women was conducted on (l0.0%) instances. The purpose of the test was to evaluate the practicality and clarity of the research instruments. The necessary changes were made by adding or removing certain questions, altering the type of some questions, and making other changes to make the research more straightforward and user-friendly in light of the pilot study's findings. Theses pregnant women excluded from the research.

Administration and Ethical consideration:

The appropriate authorities for the research setting received formal permission to collect data through an official letter sent by the Faculty of Nursing at Zagazig University. All ethical issues were taken into accountthroughout the entire study. Pregnant women were aware that all information acquired for the study was confidential and would only be utilized for research. They also had the option to leave the study at any time.

Analytical statistics:

Data organized, classified, tabulated, and subjected to suitable statistical tests. The Statistical Package for Social Science (SPSS) version 25 and the Microsoft Excel Program were used to do the statistical analysis of the data. For categorical data, frequencies and percentages were used in descriptive statistics; for quantitative data, the arithmetic mean (X) and standard deviation (SD) were used. The chi square test was used to compare qualitative variables (X2). A paired t test was used to evaluate the differences between the groups throughout the two visits. Furthermore, the R-test was employed to determine the association among the variables under investigation.

Degrees of significance of results were considered as follows:

- ► Statistically significant (S) at $P \leq 0.05$
- ► No statistically significant at $P > 0.05$
- ► Highly statistically significant (HS) at $P \leq 0.01$

Results

Table (1) clarifies that, more than half of the studied sample (54.5%) of the studied women their age ranged from 20-<30 years, the mean ± SD of women's age was 27.43±6.69 years. As regard to residence, less than half of the studied total samples (62.5%) were residing in rural areas. Regarding educational level, less than half of the studied total samples (47.2%) have high education. Most of them (81.2%) were housewife and 18.8% were working, more than one third of them (38.9%) were nurses. Also, more than half them (61.9% and 54.4%) had sufficient family income and hadn't consanguinity, respectively.

Table (2) reveals that, the mean ± SD of women's gestational age was 27.48±6.40. Also, less than two thirds of the studied total sample (63.2%) had one to two previous pregnancies, less than half of them (47.2%) had 1-2 previous labor. Also, 68.6% of them hadn't history of abortion. For history of stillbirths, 87.5% of the total sample doesn't have previous still birth. Furthermore, the majority of them (97.6%) had singleton at their birth outcome. Regarding antenatal follow up, the majority of the studied women (96.7%) maintained antenatal follow up, more than half of them (50.8%) reported follow up every two weeks. Also, 92.5% of them don't have history of delivery of child with congenital anomalies.

Table (3) reveals that, (79.1% & 70.0%) of the studied women without fetal congenital anomalies have complete correct answer regarding background about fetal congenital anomalies and definition of fetal congenital anomalies, respectively. Also, (65.0% & 67.3%) of them have complete correct answer regarding the types of fetal congenital anomalies and risk factors for developing congenital anomalies in the fetus, respectively. While, (81.0% & 58.2%) of them don't know diagnosis of fetal congenital anomalies and severe structural anomalies often need surgery shortly after birth, respectively.

Figure (1) shows that, less than one third (30.4%) of the studied women reported that their source of background about fetal congenital anomalies from friends, less than one quarter of them (23.6%) stated internet. While, 18.7% &14.5% of them their source was TV and public health center, respectively. Also, the minority of the studied pregnant women (7.7% & 5.1%) stated books and others as a source of their background about fetal congenital anomalies.

Figure (2) shows that more than two thirds (69,2%) of the studied total sample had unsatisfactory level of total knowledge about fetal congenital anomalies. while, (30,8%) of them had satisfactory level of total knowledge about fetal congenital anomalies.

Table (4) Table (V) displays the relation between demographic characteristics of the studied pregnant women and their total awareness regarding fetal congenital anomalies. It clarifies that, there was highly statistically significant differences between total awareness of the studied women and their age, education level, family income, consanguinity and body mass index at $p < 0.001$. While, there was no statistically significant differences with women's residence and work condition at $p > 0.05$.

Table (5) describes the relation between obstetric data and current medical history of the studied pregnant women and their total awareness regarding fetal congenital anomalies. It presents that, there was highly statistically significant differences between total awareness of the studied women and their gravidity, parity and history of stillbirth at $p <0.001$. While, there was no statistically significant differences with women'scurrent gestational age, history of abortion, antenatal follow up, history of delivery of child with congenital anomalies, family history of congenital anomalies and complications of current pregnancy at $p > 0.05$

Table (1): Demographic characteristics of the studied pregnant women (n=574):

Demographic characteristics	**No.**	**%**
Age (year)		
<20	56	9.8
20-<30	313	54.5
30-<40	168	29.3
≥ 40	37	6.4
Mean ± SD	**27.43±6.69**	
Residence		
Rural	359	62.5
Urban	215	37.5
Educational level		
Illiterate	104	18.1
Read and write	66	11.5
Primary education	47	8.2
Secondary education	86	15.0
High education	271	47.2
Work condition		
Housewife	466	81.2
Working	108	18.8
If working, type of occupation is (n=108)		
Nurse	42	38.9
Teacher	15	13.9
Worker	29	26.8
Employee	7	6.5
Others	15	13.9

Family income		
Sufficient	355	61.9
Just meet life expenses	165	28.7
Not sufficient	54	9.4
Consanguinity		
Yes	262	45.6
No	312	54.4

Table (2): Obstetric data of the studied pregnant women according (n=574).

Obstetric data	**Number (n=574)**	
	No.	**%**
Current gestational age (weeks)		
Second trimester	224	39.0
Third trimester	350	61.0
Mean ± SD	**27.48±6.40**	
Gravidity		
1-2	363	63.2
3-4	114	19.9
5-6	82	14.3
>6	15	2.6
Parity		
None	199	34.7
1-2	271	47.2
3-4	96	16.7
5-6	8	1.4
History of abortion		
Yes	180	31.4
No	394	68.6
If yes, number of abortions (n=180)		
One	134	74.5
Two	23	12.8
Three	17	9.4
More than three	6	3.3
History of stillbirths		
Yes	72	12.5
No	502	87.5
If yes, number of stillbirths (n=72)		
One	70	97.2
Two	2	2.8
Type of birth outcome		
Singleton	559	97.4
Multiple	15	2.6
Antenatal follow up		
Yes	555	96.7
No	19	3.3

If yes, number of antenatal visits (n=555)		
Every one week	63	11.4
Every 2 weeks	282	50.8
Every one month	210	37.8
History of delivery of child with congenital anomalies		
Yes	43	7.5
No	531	92.5

Table (3): Knowledge items distributions about fetal congenital anomalies among the studied pregnant (n=574).

Knowledge Items	**Number of sample (n=574)**					
	Complete correct answer		**Incomplete correct answer**		**Don't know**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Background about fetal congenital anomalies	454	79.1	0	0.0	120	20.9
Definition of fetal congenital anomalies	402	70.0	56	9.8	116	20.2
Types of fetal congenital anomalies	373	65.0	92	16.0	109	19.0
Risk factors for developing congenital anomalies in the fetus	386	67.3	73	12.7	115	20.0
Prevention of fetal congenital anomalies	335	58.4	78	13.6	161	28.0
Diagnosis of fetal congenital anomalies	88	15.3	21	3.7	465	81.0
Complications of fetal congenital anomalies	358	62.4	84	14.6	132	23.0
It is possible to treat some fetal congenital abnormalities intrauterine.	318	55.4	0	0.0	256	44.6
Often, surgery is required for severe structural abnormalities soon after birth.	240	41.8	0	0.0	334	58.2
There is some degree of medical treatment available for congenital defects after delivery.	274	47.7	0	0.0	300	52.3
Termination is necessary when a pregnancy has congenital defects.	256	44.6	0	0.0	318	55.4
Do congenital defects make survival impossible?	364	63.4	0	0.0	210	36.6

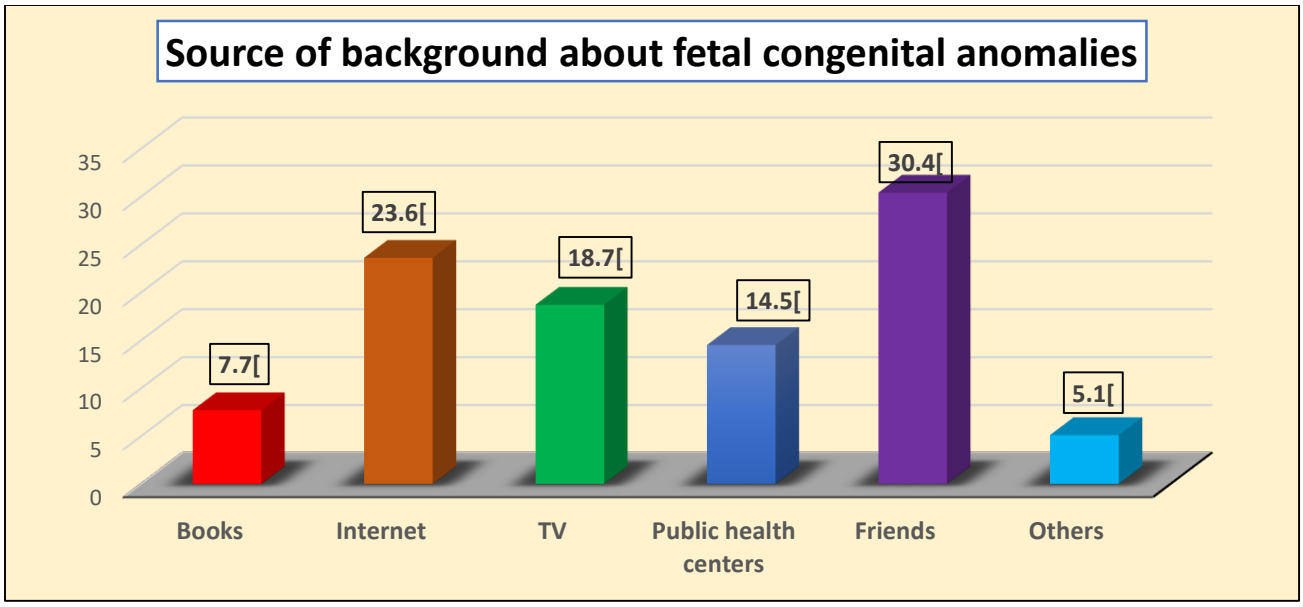

Figure (1): Percentage distribution of the studied pregnant women according to source of background about fetal congenital anomalies (n=454)

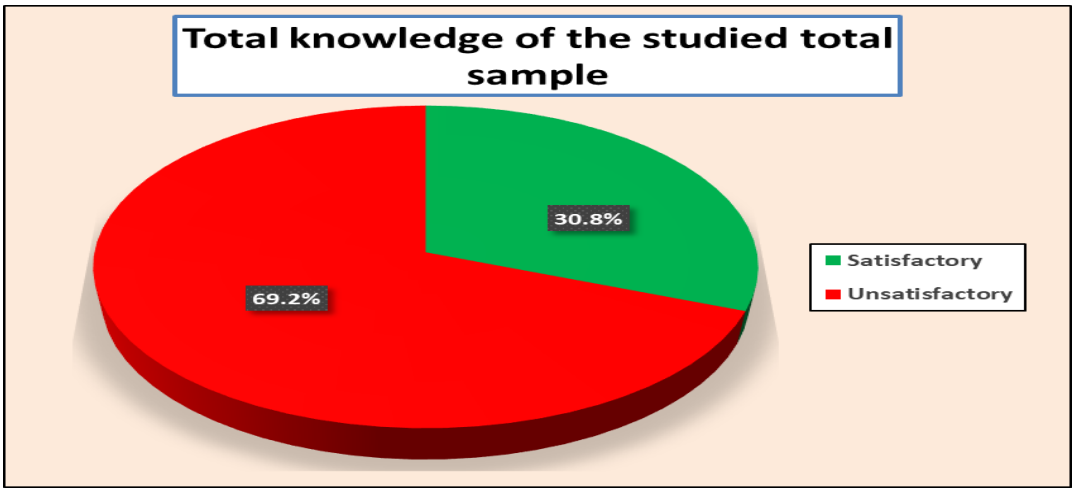

Figure (2): Total knowledge distribution of the studied sample (n=574).

Table (4): Relation between demographic characteristics of the studied pregnant women and their total knowledge about fetal congenital anomalies (n=574).

Demographic characteristics		Levels of total knowledge				X2	P-Value
		Satisfactory (n=177)		Unsatisfactory (n=397)			
		No.	%	No.	%		
Age (years)	<20	21	11.9	35	8.8	38.29	0.000**
	20-<30	124	70.1	189	47.6		

	30-<40	31	17.5	137	34.5		
	≥ 40	1	0.6	36	9.1		
Residence	Rural	116	65.5	243	61.2	0.979	0.323
	Urban	61	34.5	154	38.8		
Educational level	Illiterate	24	13.6	80	20.2	19.50	0.001**
	Read and write	14	7.9	52	13.1		
	Primary education	22	12.4	25	6.3		
	Secondary education	18	10.2	68	17.1		
	High education	99	55.9	172	43.3		
Work condition	Housewife	140	79.1	326	82.1	0.731	0.393
	Working	37	20.9	71	17.9		
Family income	Sufficient	106	59.9	249	62.7	35.73	0.000**
	Just meet life expenses	71	40.1	94	23.7		
	Not sufficient	0	0.0	54	13.6		
Consanguinity	Yes	53	29.9	209	52.6	25.42	0.000**
	No	124	70.1	188	47.4		
Body mass index	Under weight	0	0.0	7	1.8	12.86	0.005**
	Normal weight	57	32.2	139	35.0		
	Over weight	68	38.4	101	25.4		
	Obesity	52	29.4	150	37.8		

Table (5): Relation between obstetric data and current medical history of the studied pregnant women and their total knowledge about fetal congenital anomalies (n=574).

Obstetric and current medical data		**Levels of total knowledge**				**X2**	**P-Value**
		Satisfactory (n=177)		**Unsatisfactory (n=397)**			
		No.	**%**	**No.**	**%**		
Current gestational age	**Second trimester**	72	40.7	152	38.3	0.284	0.588
	Third trimester	105	59.3	245	61.7		
Gravidity	**1-2**	137	77.4	226	56.9	23.26	0.000**
	3-4	22	12.4	92	23.2		
	5-6	17	9.6	65	16.4		
	>6	1	0.6	14	3.5		
Parity	**None**	110	62.1	89	22.4	89.30	0.000**
	1-2	43	24.3	228	57.4		
	3-4	24	13.6	72	18.1		
	5-6	0	0.0	8	2.0		
History of abortion	**Yes**	54	30.5	126	31.7	0.086	0.769
	No	123	69.5	271	68.3		
History of stillbirths	**Yes**	1	0.6	71	17.9	FET 33.47	0.000**
	No	176	99.4	326	82.1		
Antenatal follow up	**Yes**	169	95.5	386	97.2	1.170	0.279
	No	8	4.5	11	2.8		
History of delivery of child with congenital anomalies	**Yes**	15	8.5	28	7.1	0.357	0.550
	No	162	91.5	369	92.9		
Family history of congenital anomalies	**Yes**	30	16.9	61	15.4	0.230	0.631
	No	147	83.1	336	84.6		
Complications of current pregnancy	**Yes**	89	50.3	166	41.8	3.556	0.059
	No	88	49.7	231	58.2		

Discussion:

This studywas designed to assess knowledge of pregnant women about fetal congenital anomalies. For residence and family income of the studied pregnant women, the current results showed that most of the studied women were residing at rural area and more than half them had sufficient family income and had consanguinity. This result might be due to this the age of productivity. On the same line, ***Kurdi et al., (2019)*** found that nearly two thirds of the sample were residing at rural area and had enough family income.

As regard to educational level and employment of the studied pregnant women, the current results found that less than half of the studied were illiterate and more than three quarters of them were housewife. These results might be attributed to nearly two thirds of the sample were residing at rural area which they may not concerned to education of female than male and prefer to be a house wife according to their social cultures. On the same context, an Egyptian study conducted by***Abdo et al., (2019)*** reported the same results which showed that that more than half of the women had low educational level and weren't workers. The similarity between the results may be due to the same society and its social cultures.

But, this result in difference with a study done by***Ajao & Adeoye, (2019)***in Nigeria who stated that that more than three quarters of the subjects had high educational level and were workers.This difference with the current results may be due to the variations between cultures of the countries.

For the studied pregnant women according to their source of background about fetal congenital anomalies, the present study revealed that less than one third of the studied women reported that their source of background about fetal congenital anomalies from friends, less than one quarter of them stated internet. While, less than one quarter of them their source was TV and public health center, respectively. Also, the minority of the studied pregnant women stated books and others as a source of their background about fetal congenital anomalies

This result could be due to each person chooses the source of obtaining information according to what is available and accessible. These results were congruent with the study achieved by ***Ogambaet al., (2021)*** who found that nearly half of the studied subjects reported that their source of information about fetal congenital anomalies from their families, friends and internet.

Concerning the studied sample according to their total knowledge about fetal congenital anomalies, the current results represented that more than two thirds of the studied pregnant women had unsatisfactory level of knowledge about fetal congenital anomalies while, less than one third of them had satisfactory level of knowledge about fetal congenital anomalies. This result may be due to lack of organized educational program provided from different health care institutions to pregnant women about congenital anomalies that leading to low level of knowledge of the studied women. This finding was in the same context with ***Fitie et al. (2022)*** who found that more than three quarters of the studied mothers had unsatisfactory level of knowledge regarding congenital anomalies among children. But, this finding was in difference with ***Kanchana et al., (2018)***who found that higher proportion of the participants (most) had good total knowledge on the risk factors, pre conception care and on preventive actions related to birth defects respectively.

Conclusion:

More than two thirds (69.2%) of the studied sample had unsatisfactory level of total knowledge about fetal congenital anomalies. While, (30.8%) of them had satisfactory level of total knowledge about fetal congenital anomalies.

Recommendation:

The researchers made the following suggestions based on the findings of the study:

- There is a need for public programs to increase knowledge about congenital anomalies in pregnant women and people.
- Use of genetic counseling for families at risk for congenital anomalies is proposed.

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